

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

59. (Currently Amended): A semiconductor manufacturing system comprising:
a wafer handling chamber having a plurality of facets, the wafer handling chamber containing a vacuum environment;
a plurality of wafer processing tools, each of the tools being attached to a respective facet on the wafer handling chamber, wherein one of the tools has attached a modular optical inspection system that reviews semiconductor wafers for defects, the modular optical inspection system including,
a plurality of modular inspection subsystems each configured to detect defects on a portion of a semiconductor wafer, wherein at least two of the subsystems are of different types, each type measuring a different parameter for detecting a specific wafer defect;
a mechanism for moving at least one of the semiconductor wafer and the plurality of modular inspection subsystems with respect to one another; and
a master processor configured to process data delivered from at least some of the modular inspection subsystems, wherein a first one of the plurality of modular inspection subsystems includes a local processor configured to process data collected by the first modular inspection subsystem
~~a first metrology tool attached to one of the facets of the wafer handling chamber, wherein the first metrology tool measures critical dimensions on pattern etched semiconductor wafers; and~~
a wafer handler located within the wafer handling chamber for transporting semiconductor wafers between each of the plurality of facets.

60. (Canceled)

61. (Canceled)

62. (Currently Amended): A semiconductor manufacturing system as recited in claim 59 further comprising:

a first metrology tool attached to one of the facets of the wafer handling chamber, wherein the first metrology tool measures critical dimensions on pattern-etched semiconductor wafers; and

a second metrology tool, wherein the second metrology tool is an ellipsometer configured to measure the thickness of a layer on the surface of the semiconductor wafer.

63. (Previously Presented): A semiconductor manufacturing system as recited in claim 59 wherein at least one of the processing tools is a type of tool selected from the group consisting of a CVD reactor, an etcher, and a stripper.

64. (Previously Presented): A semiconductor manufacturing system as recited in claim 59 further comprising:

a wafer storage cassette that is attached to one of the facets on the wafer handling chamber.

65. (Currently Amended): A method of manufacturing a semiconductor wafer comprising:

providing a wafer handling chamber having a plurality of facets, the wafer handling chamber containing a vacuum environment;

providing a plurality of wafer processing tools, each of the tools being attached to a respective facet on the wafer handling chamber, wherein one of the tools has attached a modular optical inspection system that reviews semiconductor wafers for defects, the modular optical inspection system including,

a plurality of modular inspection subsystems each configured to detect defects on a portion of a semiconductor wafer, wherein at least two of the subsystems are of different types, each type measuring a different parameter for detecting a specific wafer defect;

a mechanism for moving at least one of the semiconductor wafer and the plurality of modular inspection subsystems with respect to one another; and

a master processor configured to process data delivered from at least some of the modular inspection subsystems, wherein a first one of the plurality of modular inspection subsystems includes a local processor configured to process data collected by the first modular

inspection subsystem;

providing a metrology tool attached to one of the facets of the wafer handling chamber, wherein the metrology tool measures critical dimensions on pattern-etched semiconductor wafers;

transferring the semiconductor wafer from one of the plurality of wafer processing tools to the metrology tool; and

measuring the dimension of at least one feature on the semiconductor wafer with the metrology tool.

66. (Canceled)

67. (Previously Presented): A method of manufacturing a semiconductor wafer as recited in claim 65 wherein the metrology tool is an optical detector.

68. (Currently Amended): A semiconductor manufacturing system as recited in claim 5962 wherein the first metrology tool is an optical detector.

69. (Previously Presented): A semiconductor manufacturing system comprising:

a wafer handling chamber having a plurality of facets, the wafer handling chamber containing a vacuum environment;

a plurality of wafer processing tools, each of the wafer processing tools being attached to a respective facet on the wafer handling chamber;

at least two inspection tools, wherein each inspection tool is configured to generate a defect report for an associated wafer processing tool; and

a computer containing a defect database that collects defect reports from each of the inspection tools, whereby statistical process control of each associated wafer processing tool is performed.

70. (Previously Presented): A semiconductor manufacturing system as recited in claim 69 wherein there is an inspection tool associated with each of the wafer processing tools.

71. (Previously Presented): A semiconductor manufacturing system, comprising:

a wafer handling chamber having a plurality of facets, the wafer handling chamber containing a vacuum environment;

a plurality of wafer processing tools, each of the wafer processing tools being attached to a respective facet on the wafer handling chamber; and

a modular inspection tool attached to one of the facets of the wafer handling chamber, the modular inspection tool including a plurality of inspection sensors and metrology sensors, whereby the metrology sensors measure critical dimensions on pattern-etched semiconductor wafers.

72. (Previously Presented): A semiconductor manufacturing system as recited in 71 wherein the inspection sensors and metrology sensors are interleaved.

73. (Previously Presented): A method of inspecting semiconductor wafers on a wafer handling chamber, comprising:

providing a wafer handling chamber having a plurality of facets, the wafer handling chamber containing a vacuum environment;

providing a plurality of wafer processing tools, each of the wafer processing tools being attached to a respective facet on the wafer handling chamber;

providing a modular inspection tool for attaching to a facet of the wafer handling chamber wherein the modular inspection tool includes a plurality of interleaved inspection and metrology sensors;

performing a first scan of a semiconductor wafer with the modular inspection tool wherein the inspection sensors are used to inspect the wafer for defects; and

performing a second scan of the semiconductor wafer with the modular inspection tool wherein the metrology sensors are used to measure critical dimensions on the wafer.

74. (Previously Presented): A method of inspecting semiconductor wafers on a wafer handling chamber as recited in claim 73, further comprising:

transferring the semiconductor wafer from one of the plurality of wafer processing tools to the modular inspection tool.

75. (New): A semiconductor manufacturing system as recited in claim 59, wherein the plurality of modular inspection subsystems are placed adjacent to one another such that each adjacent subsystem reviews a corresponding portion of the semiconductor wafer for defects.

76. (New): A semiconductor manufacturing system as recited in claim 75, wherein at least two of the plurality of modular inspection subsystems perform the detection for defects simultaneously.

77. (New): A semiconductor manufacturing system as recited in claim 59, wherein the measured parameters are selected from the group comprising of hot spots, deposition thicknesses, and critical dimensions.

78. (New): A semiconductor manufacturing system as recited in claim 69 wherein the at least two inspection tools each includes,

- a plurality of modular inspection subsystems each configured to detect defects on a portion of a semiconductor wafer, wherein at least two of the subsystems are of different types, each type measuring a different parameter for detecting a specific wafer defect;
- a mechanism for moving at least one of the semiconductor wafer and the plurality of modular inspection subsystems with respect to one another; and
- a master processor configured to process data delivered from at least some of the modular inspection subsystems, wherein a first one of the plurality of modular inspection subsystems includes a local processor configured to process data collected by the first modular inspection subsystem.

79. (New): A semiconductor manufacturing system as recited in claim 71, wherein the plurality of inspection sensors and metrology sensors are placed adjacent to one another such that each adjacent sensor reviews a corresponding portion of the semiconductor wafer.

80. (New): A semiconductor manufacturing system as recited in claim 79, wherein at least two of the plurality of inspection sensors and metrology sensors perform simultaneously.

81. (New): A semiconductor manufacturing system as recited in claim 73, wherein the plurality of interleaved inspection and metrology sensors are placed adjacent to one another such that each adjacent sensor reviews a corresponding portion of the semiconductor wafer.

82. (New): A semiconductor manufacturing system as recited in claim 81, wherein at least two of the plurality of interleaved inspection and metrology sensors perform simultaneously.

83. (New): A semiconductor manufacturing system as recited in claim 78, wherein the plurality of modular inspection subsystems are placed adjacent to one another such that each adjacent subsystem reviews a corresponding portion of the semiconductor wafer for defects.

84. (New): A semiconductor manufacturing system as recited in claim 83, wherein at least two of the plurality of modular inspection subsystems perform the detection for defects simultaneously.

85. (New): A semiconductor manufacturing system as recited in claim 75, wherein the plurality of modular inspection subsystems are placed adjacent to one another such that the subsystems are adjoined together side-by-side.